Functional Description of "ego FLASH" Handsfree System

The "ego FLASH" handsfree system supports communication with a Bluetooth-compatible mobile phone. Furthermore, audio devices that support the A2DP Bluetooth profile can be operated using the "ego FLASH". The handsfree system is directly connected to the audio system and the on-board vehicle power supply.
The handsfree system is controlled via a wired control unit and is connected with the telephone using a Bluetooth radio communication.
There are two basic options for the connection to the vehicle (illustration 1 and illustration 2).

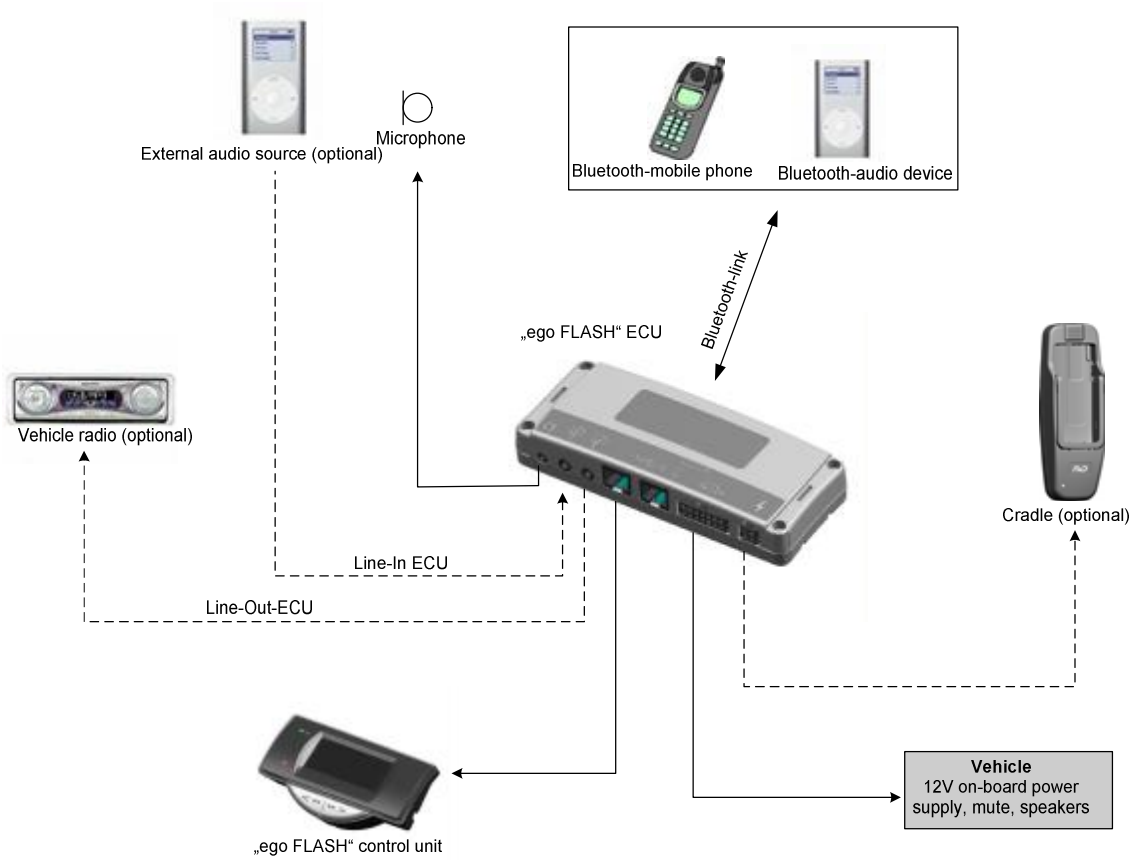

Illustration 1

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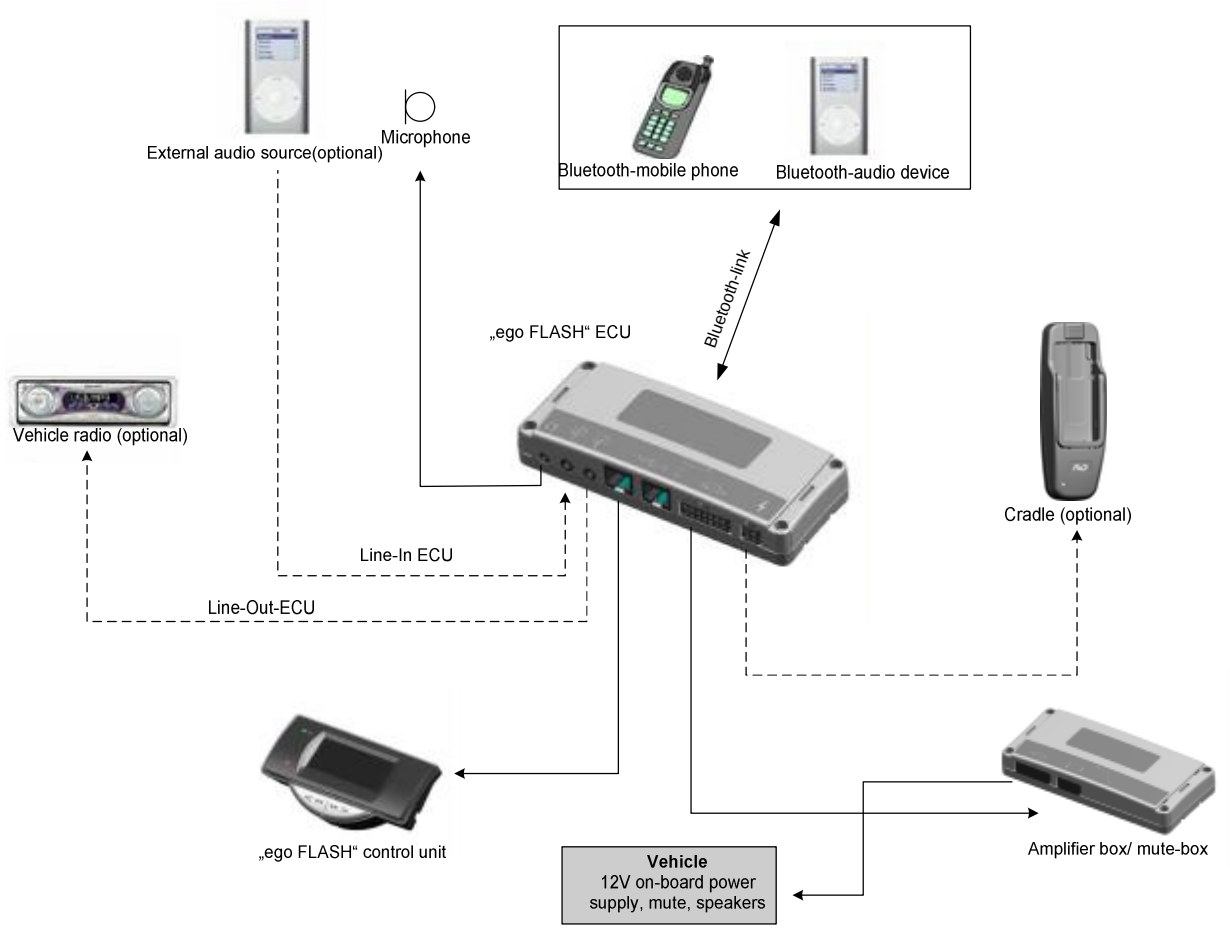

Illustration 2

The "ego FLASH" handsfree system consists of an electronics box and a control unit with an integrated display unit. The electronics box of the handsfree system has the following connection options (see illustration 3):

- 2.5 mm stereo jack for feeding in the microphone signal (G)
- 3.5 mm stereo jack for feeding in an external stereo audio signal (I)
- 3.5 mm stereo jack for outputting the audio data of the handsfree system (H) (calls, music, ringtones, etc.)
- 14-pin Molex Micro-Fit connector for connecting the handsfree system to the vehicle (power, audio) (K)
- 4-pin Molex Micro-Fit connector for connecting an optional cradle (L)
- 2 x RJ11 connectors (I^2C interface) for connecting the control unit and optional accessories (J)

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The required supply voltage (3.3 V, 8 V, 5 V) is provided in the "Power supply" section of the circuit. There are two different channels over which the external raw voltage can be supplied to the handsfree system:

1. via the direct connection to the vehicle through the 14-pin Molex Micro-Fit connector (connection design in illustration 1), or
2. via the mute box available as an option (connection design in illustration 2).

Block diagram:

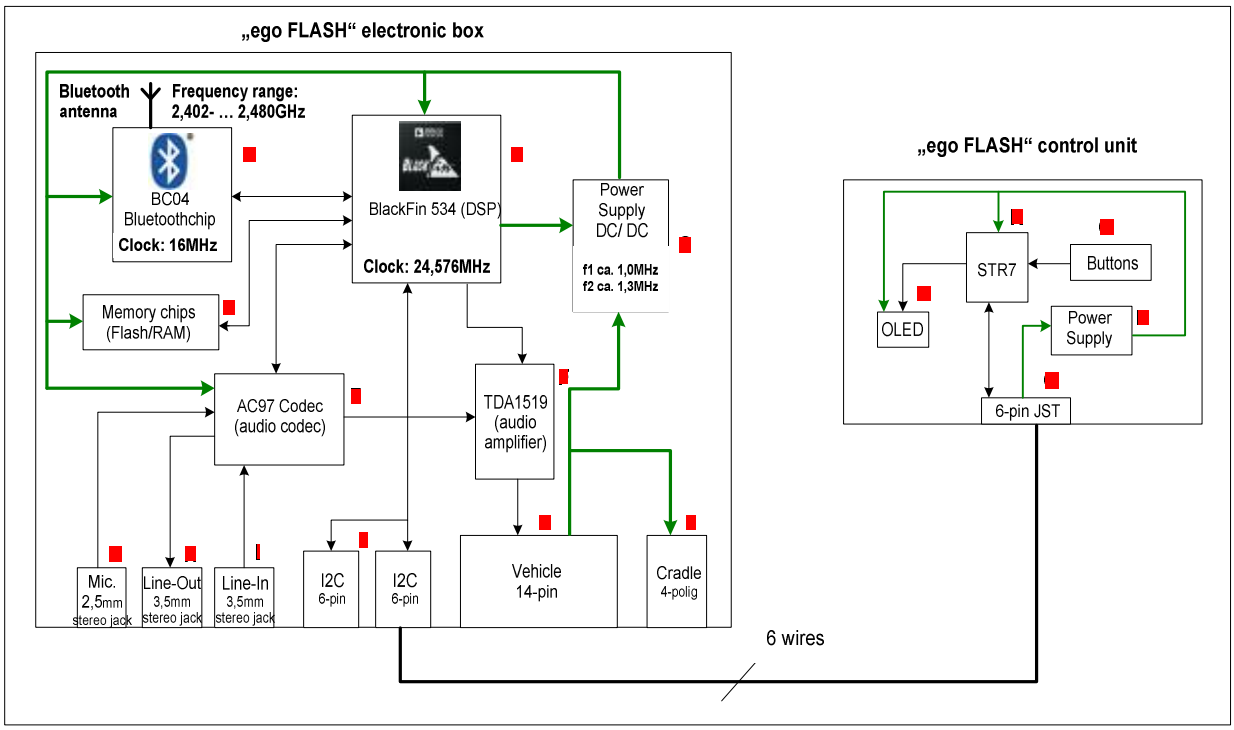

Illustration 3

The BlackFin DSP (B) is the central controller and function unit of the electronics box. Both flash and RAM are installed in this for the implementation of the program sequence. The BlackFin implements the communication and control of the Bluetooth module (A), the AC97 audio codec and the TDA1519 audio amplifier. The DSP also contains means of communication with the control unit.
The BC04 Bluetooth chip (A: see description data sheet, appendix 1) creates the interface to the telephone via Bluetooth radio communication. The AC97 audio codec (E) assists in the management of the different audio signals of the "ego FLASH" handsfree system. With the connection design without an external amplifier box, the amplification of the audio signals to the vehicle is implemented by the TDA1519 audio amplifier (F).
The control unit is used to control the handsfree system and display the functions. The controller of the control unit is a STR7 microcontroller (N). This evaluates the buttons (O) and is responsible for controlling the OLED display (M). It also implements the I^2C communication with the electronics box. The control unit is supplied with voltage, which is converted into the appropriate component voltages by the "Power supply" (P) section of the circuit, via the electronics box.

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